

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 December 2001 (27.12.2001)

PCT

(10) International Publication Number
WO 01/97605 A1

(51) International Patent Classification⁷: **A01K 5/01,**
B65D 85/72

[GB/GB]; Pedigree Pet Foods, Mill Street, Melton Mow-
bray, Leicestershire LE13 1BB (GB).

(21) International Application Number: PCT/GB01/02757

(74) Agents: CORNISH, Kristina, Victoria, Joy et al.; Kil-
burn & Strobe, 20 Red Lion Street, London WC1R 4PJ
(GB).

(22) International Filing Date: 21 June 2001 (21.06.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0015441.9 23 June 2000 (23.06.2000) GB

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK,
SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA,
ZW.

(71) Applicant (*for all designated States except US*): MARS
UK LIMITED [GB/GB]; 3D Dundee Road, Slough, Berk-
shire SL1 4LG (GB).

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): BRUCE, Jennifer,
Susan [GB/GB]; Waltham Centre for Pet Nutrition,
Waltham-on-the-Wolds, Leicestershire LE14 4RT (GB).
BRADLEY, Richard, G. [GB/GB]; Waltham Centre
for Pet Nutrition, Waltham-on-the-Wolds, Leicestershire
LE14 4RT (GB). HALL, Simon, Reginald [GB/GB];
Waltham Centre for Pet Nutrition, Waltham-on-the-Wolds,
Leicestershire LE14 4RT (GB). HARFORD, Stephen

Published:

— with international search report

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

WO 01/97605 A1

(54) Title: FOOD PACK

(57) Abstract: The present invention provides a food pack for a companion (or pet) animal. The food pack comprises at least two vessels. A first vessel holds a first pet food product and a second vessel holds a second pet food product. The composition of the food products in the two vessels are different. A third vessel holding a third pet food product may also be present. In a particular embodiment, the composition of the food products in two vessels differ in fat energy content by at least 5 % of the total calorific value of each product.

Food Pack

5 The present invention provides a food pack for a companion (or pet) animal. The food pack comprises at least two vessels. A first vessel holds a first pet food product and a second vessel holds a second pet food product. The composition of the food products in the two vessels are different. A third vessel holding a third pet food product may also be present. In a particular embodiment, the composition of the food products in two vessels differ in fat energy content by at least 5 % of the total calorific value of each product.

15 It is a constant desideratum to determine novel feeding regimes and novel food combinations for companion animals. Such feeding regimes can contribute to overcoming feeding problems in fussy animals, unhealthy eating, lack of enjoyment of eating for the animals and lack of enjoyment or satisfaction experienced by the animal carer/owner.

20 The present invention provides a food pack for a companion animal, which contributes to overcoming the problems described above. The food pack comprises at least two vessels, wherein a first vessel holds a first pet food product and a second vessel holds a second pet food product and wherein the composition of the first pet food product and composition of the second pet food product are not the same. A vessel is any object that is, or can be used as, a container. The food pack may further comprise one or more additional vessels. The additional third or further vessel may also hold a pet food product. The composition of such a pet food product may be the same or different from the composition of one or more other pet food products in the vessels of the food pack. The pet food product in the third vessel "the third pet food product" may be of a different composition from the

composition of the first pet food product and from the composition of the second pet food product.

5 The food pack according to the present invention enables the provision, to a companion animal, of meals specifically formulated to meet a macronutrient preference for different times of the day. A macronutrient preference, by companion animals, for different times of the day has been identified by the inventors and provides the technical basis for the present invention. In accordance with these findings, the food pack of the present invention, in particular, provides a diet to enhance the animal's enjoyment of the food and to provide an increase (perceived or real) in enjoyment or satisfaction by the carer/owner of the companion animal.

15 The companion animals of the present invention are, in particular, the domestic cat (*Felis domesticus*) or the domestic dog (*Canis domesticus*). Other companion animals include, fish, bird and horse.

20 Different nutrient profiles of food (nutritional compositions) include different contents of one or more of fat, protein, carbohydrate, calorie density, fibre, vitamins or minerals. The composition of the first pet food product will have a higher or lower content of one or more of these nutritional components compared to the composition of the second pet food product.

25 In accordance with a typical feeding regime for a companion animal, the animal is fed one meal in the morning and one meal in the afternoon/evening, with optional treats and/or snacks in between. Accordingly, the food pack of the present invention preferably comprises one pet food product for feeding as the morning meal and one

pet food product for feeding as the afternoon/evening meal. Additional snacks for in between meals or additions to the main meal (e.g. kibbles) may be included.

5 One macronutrient preference which has been shown by companion animals is for an increase in the total fat content of the afternoon/evening meal compared to the morning meal. Accordingly, the food pack of the invention preferably includes one of the pet food products having a higher content of fat than one other pet food product in the pack. The product with the higher fat content is preferably fed to the companion animal as the afternoon/evening meal.

10 Another macronutrient preference has been shown by companion animals for a composition having a higher protein content for the morning food compared to the afternoon/evening meal. Accordingly, the food pack of the present invention may include one pet food product having a higher content of protein than one other pet
15 food product in the pack. The product with the higher protein content is preferably fed to the pet animal as the main morning meal.

A preferred feature of the present invention results from a demonstrated increase in relative intake for the higher fat product in the afternoon/evening meal compared
20 with products with a lower fat content. The higher fat content is preferably in replacement of protein or in replacement of carbohydrate.

In accordance with the guidelines for complete nutritional adequacy, the following are preferred limits for all foods of the present invention: no less than 20% of the
25 calories should be from fat; no less than 25% of the calories should come from protein; no food should contain more than 75% of calories from fat. Accordingly, the preferred food contains between 20% and 75% of calories from fat.

Further preferences for the food of the dietary regime of the present invention are that the fat content of the afternoon/evening food should be higher than the fat content of the morning food by at least 5% of the total calorie content of the food.

5 Further preferences are that the calories contributed by the fat content of the food for the morning should be between 20% and 70% of the total calorie content of the food and the fat content of the food for the afternoon/evening should contribute between 25% and 75% of the total calorie content of the. The food fed in the afternoon/evening should be higher in fat content than the morning food by at least 5% of the total calorific value of the product, preferably by 10%, more preferably
10 by 15%.

Each pet food product may be a dry, semi-moist or a moist (wet) product. Wet food includes food that is usually sold in tins and has a moisture content of 70% to 90%. Dry food includes food having a similar composition but with 5% to 15% moisture,
15 often presented as small biscuit - like kibbles. Semi-moist food includes food having a moisture content of from above 15% up to 70%. The amount of moisture in any product may influence the type of packaging that can be used or is required.

The pet food products as part of the food pack according to the present invention
20 encompass any product that a pet consumes in its diet. Thus, the invention covers the standard food products as well as pet food snacks (for example snack bars, cereal bars, snacks, biscuits and sweet products). The food product may be a cooked product. It may incorporate meat or animal-derived material (such as beef, chicken, turkey, lamb, fish, blood plasma, marrowbone, etc or one or more thereof). The
25 product alternative may be meat-free (preferably including a meat substitute such as soya, maize gluten or a soya product) in order to provide a protein source. The product may contain additional protein sources such as soya protein concentrate, milk, protein, gluten, etc. The product may also contain a starch source such as one

or more grains (e.g. wheat, corn, rice, oats, barley, etc) or may be starch-free. The product may incorporate or be a gelatinised starch matrix. The product may incorporate one or more types of fibre such as sugar beet pulp, chicory pulp, chicory, coconut endosperm fibre, wheat fibre etc. The content of the product/ingredients contributes towards the macronutrient profile of the food. Thus, food products which according to the present invention provide a higher fat content will be designed accordingly. Dairy products, such as those incorporating a cream or a cheese sauce, may be suitable. The present invention is particularly relevant for a pet food product as described herein which is sold as a pet food, in particular a pet food for a dog or a cat.

The vessels of the food pack may be of any material, shape or size. Their function is, predominantly, to enable ease of use to the carer/owner of the companion animal and/or the ease of feeding by the companion animal.

The two or more vessels may be linked to form a single unit (i.e. two or more linked vessels). Such a unit may be in the form of a bowl or dish from which the animal can feed directly. In this embodiment, the packaging preferably includes a lid or lid type arrangement or seal for individual vessels such that one vessel can be opened independently of any other vessel. Preferably the single unit is of plastic, for example moulded plastic

An alternative arrangement is where the two or more vessels are not designed in particular for the animal to feed directly. Such packaging may be metal (usually in the form of a tin, can or flexifoil), plastic (including a plastic bottle), paper or card. One embodiment includes a single unit comprising a bag of flexible material divided into at least two vessels by a linking and separating section.

In another embodiment, the two or more vessels may be packed together by packaging means. In this situation two or more tins, cans, bags, flexifoils, etc may be packaged together for sale to the customer. This arrangement can provide the carer/owner of the companion animal with a food pack for their companion animal for a particular unit of time. Such a unit of time, for example, is one day. Such a food pack would thus include all of the necessary pet food products for their companion animal for one day. The food pack therefore allows the carer/owner to simply make available to the companion animal the food products in the food pack for a single day. This enables ease of use, particularly for owners/carers who take their companion animals away from home (travelling), and those who have busy lives as well as those owners/carers who do not necessarily know how much food to give to their companion animal. The two or more vessels may or may not be linked to form a single unit within the packaging means.

The packaging means enables individual food packs to be combined (as a multi-pack") for periods of time such as one week, or even longer. Accordingly, such a "multi-pack" may comprise seven individual food packs, each one for a day of the week. The individual food packs may be identical or different.

The food pack according to the present invention provides benefits to the companion animal of increased acceptance/palatability increased in enjoyment in feeding and/or increase in enjoyment or satisfaction by the carer/owner of the animal.

The enjoyment of the animal and/or increase in acceptance/palatability can be determined, for example, by one or more of the following:

- An increase in the quantity of food consumed;
- A decrease in the frequency of refusals to eat over an extended period of time;

- An increase in enthusiasm during the meal as indicated by a reduction in the time taken to start a meal and/or an increase in the speed at which food is consumed;
- The animal chooses the food over another food;
- The animal refuses other foods;

5

or by any other behaviour by the animal which is taken by the owner/carer to be an indication of enjoyment of the food, for example:

- The animal rubs around the owner /carer when serving the food.
- 10 - The animal is inactive/rests or sleeps after eating.
- The animal licks itself or washes after eating.

The invention is described with reference to the drawings, where:

15 Figure 1 shows average quantities consumed in the first 20 minutes of a meal in relation to wet diets that differ in terms of their protein and fat content for morning and afternoon meals.

Figure 2 shows average quantities consumed in the first 20 minutes of a meal in relation to wet diets that differ in terms of their content of protein fat and
20 carbohydrate for morning and afternoon meals.

Figure 3 shows average quantities consumed of dry diets in a 60 minute morning meal and a 30 minute afternoon meal where the diets vary in their content of fat and carbohydrate.

25 The invention will now be described with reference to the following, non-limiting examples:

Examples

Macronutrient energy content for all examples (and in accordance with the embodiments of the present invention) is determined by the calculations in Annex 1.

- 5 The following data demonstrate the difference between morning and afternoon macronutrient preferences.

Example 1: Studies with wet cat food diets of varying protein and fat contents.

- 10 Diets were designed containing different levels of the macronutrients protein and fat. All diets were isocaloric and contained 3 different ratios of protein to fat calories i.e. 10%:90%, 40%:60% and 70%:30% respectively (increasing in calories derived from protein). All 3 diets were fed in rotation for 30 days, i.e. each cat was fed one diet per day; therefore each diet was experienced 10 times. Food was provided for
15 45 minutes in the morning, then the same diet was fed overnight.

- Feeding data from the first 20 minutes of the morning meal and the first 20 minutes of the afternoon meal showed that in the morning, there was similar separation of 10%, 40% & 70% protein calorie diets. Overall, these data indicate that cats prefer
20 diets containing higher protein in the morning.

- In the afternoon meal, there was less preference for the 70% diet relative to 40% & 10% PER diets. Overall, these data indicate that cats preferred relatively lower protein (and hence higher fat) in the afternoon.

- 25 The average intake of each diet over the whole 30 days of the trial, for morning and afternoon meals, is shown in figure 1. The consumption of each product is

expressed as a percentage of the total eaten within the all the meals in the morning or all the meals in the afternoon.

Example 2: Studies with wet cat food diets of varying protein, fat and carbohydrate contents.

5

Canned diets were designed that had the same base meat recipe, to which was added isocaloric amounts of protein, fat and carbohydrate. All 3 diets were fed in rotation for 30 days, i.e. each cat was fed one diet per day; therefore each diet was experienced 10 times. Food was provided for 45 minutes in the morning, then the
10 same product was fed for 45 minutes in the afternoon.

Feeding data from the first 20 minutes of the morning meal and the first 20 minutes of the afternoon meal showed that in the morning, preference was for the products supplemented with protein over the products supplemented with fat over the products
15 supplemented with carbohydrate.

In the afternoon meal, fat is significantly preferred over the other products. Overall, these data indicate that cats preferred higher fat (rather than protein or carbohydrate) in the afternoon.

20

The average intake of each diet over the whole 30 days of the trial, for morning and afternoon meals, is shown in figure 2. The consumption of each product is expressed as a percentage of the total eaten within the all the meals in the morning or all the meals in the afternoon.

25

Further data have been obtained using these same products under a different feeding regimen, i.e. a 45 minute meal in the morning followed by an overnight meal of the same product. Feeding data from the first 20 minutes of the morning meal and the

first 20 minutes of the afternoon meal showed that the preference was clearly for fat in the afternoon. A preference is also shown for protein in the morning.

Example 3: Studies with dry diets of various fat and carbohydrate contents

5 Five dry diets of approximately constant protein content, but varying in fat and carbohydrate content were fed in rotation for 5 days, i.e. each cat was fed one diet per day but different groups of cats were exposed to the diets in different orders. Food was provided for 60 minutes in the morning and then the same product was fed for 30 minutes in the afternoon.

10

The diets had fat contents of 21%, 16.5%, 12%, 10% and 9% on a dry matter basis, equivalent to fat energy contents of 44%, 37%, 28%, 25% and 23%.

15

In the morning meals there was little difference in the mean intakes of the high and low fat dry diets. However, in the afternoon meal, the average data showed a clear trend to higher intakes for the high fat products rather than the low fat products, see figure 3.

Annex 1

20

Calculations for predicting the metabolisable energy (PME) of foods for companion animals.

25

These calculations use modified Atwater factors based on recommended texts e.g. Association of American Feed Control Officials, and species specific studies.

Cat Products:

Canned: $(\% \text{ Protein} \times 3.9) + (\% \text{ Fat} \times 7.7) + (\% \text{ NFE} \times 3.0) - 5.0 = \text{kcal PME/100g product}$

5 Dry: $(\% \text{ Protein} \times 3.5) + (\% \text{ Fat} \times 8.5) + ((\% \text{ NFE} - \% \text{ Crude Fibre}) \times 3.5) = \text{kcal PME/100g product}$

Dog Products

10 Canned and Dry: $(\% \text{ Protein} \times 3.5) + (\% \text{ Fat} \times 8.5) + ((\% \text{ NFE} - \% \text{ Crude Fibre}) \times 3.5) = \text{kcal PME/100g product}$

NFE = Nitrogen Free Extract and is calculated by difference: $100 - (\% \text{ Protein} + \% \text{ Fat} + \% \text{ Ash} + \% \text{ Moisture})$

15 The % protein, fat, ash, moisture and/or crude fibre are determined in accordance with the Standard Proximate Analysis as set out in Pearson's Composition and Analysis of Foods, Ninth Edition (1991).

Other Embodiments

20

It is to be understood that, while the invention has been described in conjunction with the detailed description thereof, the foregoing description is intended to illustrate and not limit the scope of the invention. Other aspects, advantages, and modifications of the invention are within the scope of the claims set forth below.

Claims

1. A food pack for a companion animal comprising at least two vessels,
wherein;
5 A first vessel holds a first pet food product; and a second vessel holds a
second pet food product, wherein the composition of the first pet food
product and the composition of the second pet food product are not the same.
2. A food pack for a companion animal as claimed in claim 1, which comprises
10 a third vessel.
3. A food pack as claimed in claim 2, wherein the third vessel holds a third pet
food product and wherein the third pet food product is of a different
composition from the composition of the first pet food product and from the
15 composition of the second pet food product
4. A food pack for a companion animal, as claimed in any one of claims 1 to 3,
wherein the composition of the first pet food product has a higher content of
protein than the composition of the second pet food product.
20
5. A food pack for a companion animal as claimed in any one of claims 1 to 4,
wherein the composition of the second pet food product has a higher content
of fat than the composition of the first pet food product.
- 25 6. A food pack for a companion animal, as claimed in any one of claims 1 to 5,
wherein one of the pet food products is a dry composition.
7. A food pack for a companion animal as claimed in any one of claims 1 to 6,

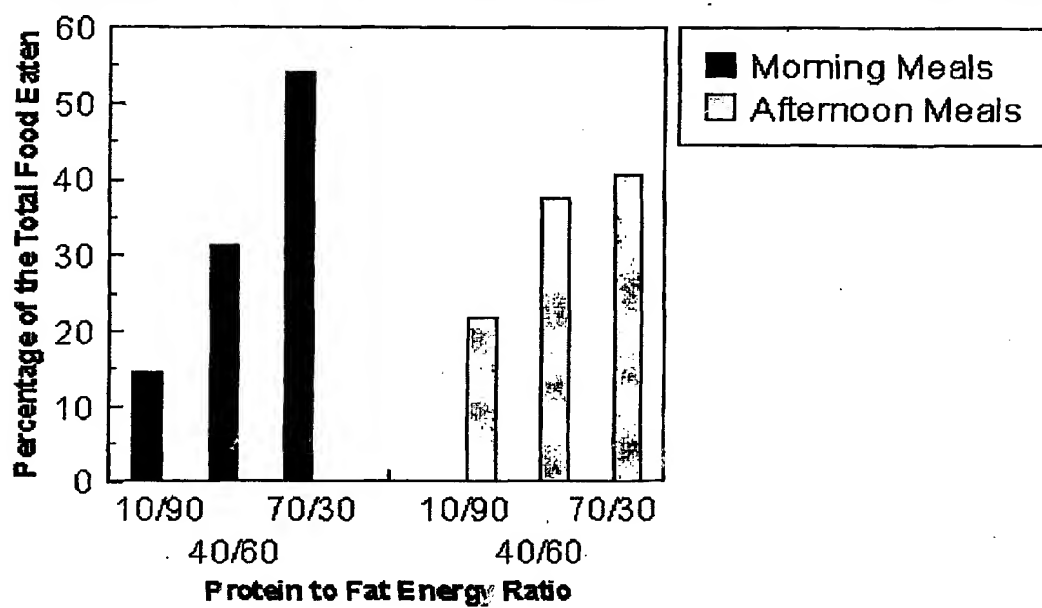
wherein one of the pet food products is a drink.

- 5
8. A food pack for a companion animal, as claimed in any one of claims 1 to 7, wherein the first pet food product is savoury and the second pet food product is sweet.
9. A food pack for a companion animal, as claimed in any one of claims 1 to 8, wherein at least two vessels are linked to form a single unit.
- 10
10. A food pack for a companion animal, as claimed in claim 9, wherein the single unit is of plastic.
11. A food pack for a companion animal, as claimed in claim 9, wherein the single unit comprises a bag of flexible material divided into at least two vessels by a linking and separating section.
- 15
12. A food pack for a companion animal, as claimed in any one of claims 1 to 8, which comprises at least two vessels packed together by packaging means.
- 20
13. A food pack for a companion animal, as claimed in claim 12, wherein at least two vessels are not linked.
14. A food pack for a companion animal, as claimed in any one of claims 1 to 13, wherein the third vessel is not linked to either of the first vessel or the second vessel.
- 25
15. A food pack for a companion animal, as claimed in any one of claims 1 to 14, wherein the first pet food product and the second pet food product differ

in their content of one or more of: fat, protein, carbohydrate, calorie density, fibre, vitamins or minerals.

- 5 16. A food pack for a companion animal, as claimed in any one of claims 1 to 15, wherein the composition of the first food product and the composition of the second pet food product differs in fat energy content by at least 5% of the total calorific value of each product.
- 10 17. A food pack for a companion animal, as claimed in any one of claims 1 to 16, wherein the first pet food product has a fat content of from 20% to 70% of the total calorific value.
- 15 18. A food pack for a companion animal, as claimed in any one of claims 1 to 17, wherein the second pet food product has a fat content of from 25% to 75% of the total calorific value.

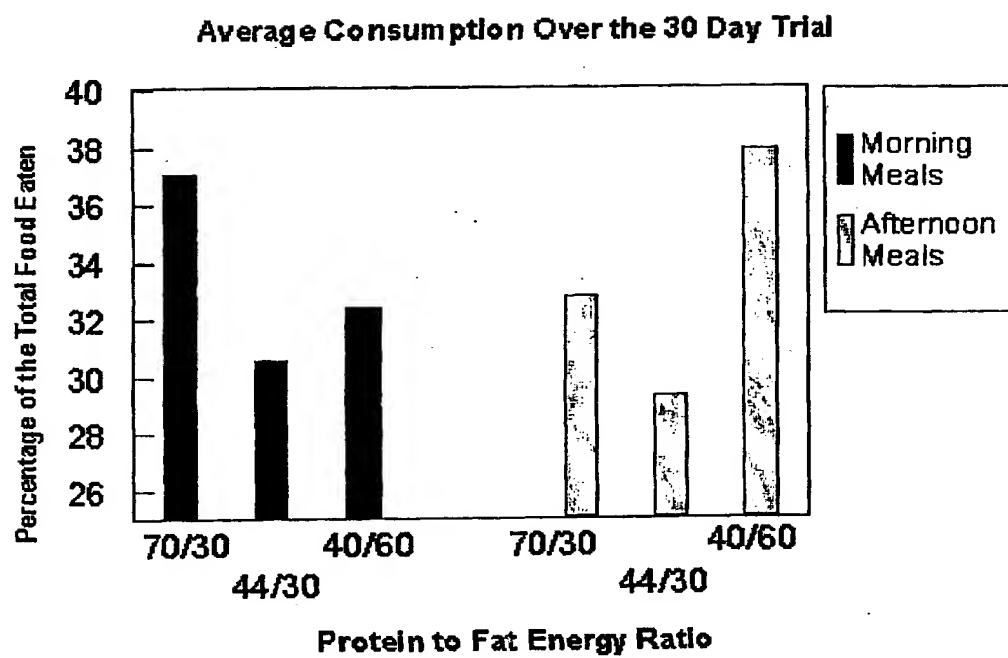
Figure 1

Average Proportional Consumption Over The 30 Day Trial

5

10

Figure 2



5

10

5

Figure 3

